EXPERIMENTAL CELL RESEARCH

EDITOR-IN-CHIEF
N. RINGERTZ

ASSISTANT EDITOR
S. ERIKSSON

EDITORS
R. BASERGA · H. M. BLAU · M. BUSTIN · B. CANNON · E. DE ROBERTIS · D. EPEL
W. W. FRANKE · S. J. KAUFMAN · N. LE DOUARIN · G. MAGNUSSON · D. MAZIA
J. MELDOLESI · G. L. NICOLSON · B. ÖBRINK · I. PASTAN · D. M. PRESCOTT · R. ROSS · E. ROZENGURT
F. H. RUDDLE · R. SAGER · U. SCHEER · R. TIMPL · K. WEBER · A. M. ZIMMERMAN

FOUNDING EDITORS
T. CASPERSSON and J. RUNNSTRÖM

VOLUME 181 · 1989

ACADEMIC PRESS, INC.
Harcourt Brace Jovanovich, Publishers
San Diego New York Boston
London Sydney Tokyo Toronto

COPYRIGHT © 1989 BY ACADEMIC PRESS, INC.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (27 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1989 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0014-4827/89 $3.00

Printed in Sweden by

Almqvist & Wiksell Tryckeri, Uppsala 1989

CONTENTS OF VOLUME 181

NUMBER 1 MARCH 1989

REGULAR ARTICLES

K. Leroy-Viard, M. Jandrot-Perrus, G. Tobelem, and M. C. Guillin. Covalent Binding of Human Thrombin to a Human Endothelial Cell-Associated Protein 1

Catherine P. Chia and Elizabeth J. Luna. Phagocytosis in *Dictyostelium discoideum* Is Inhibited by Antibodies Directed Primarily against Common Carbohydrate Epitopes of a Major Cell-Surface Plasma Membrane Glycoprotein 11

G. Géraud, F. Laquerrière, C. Masson, J. Arnoult, B. Labidi, and D. Hernandez-Verdun. Three-Dimensional Organization of Micronuclei Induced by Colchicine in PtK_1 Cells 27

Janet Smith and Martin L. Hooper. Dominance and Independent Segregation of Metabolic Cooperation-Competence and Pluripotency in an Embryonal Carcinoma Cell Hybrid 40

Cor D. Schoen, Jos C. Arents, Taco Bruin, and Roel Van Driel. Intracellular Localization of Secretable cAMP in Relaying *Dictyostelium discoideum* Cells 51

Magnus Hansson, Ingrid Blikstad, and Björn Öbrink. Cell-Surface Location and Molecular Properties of Cell-CAM 105 in Intestinal Epithelial Cells 63

A. Bikfalvi, E. Dupuy, A. L. Inyang, N. Fayein, G. Leseche, Y. Courtois, and G. Tobelem. Binding, Internalization, and Degradation of Basic Fibroblast Growth Factor in Human Microvascular Endothelial Cells 75

Günter Kostka. Characterization and Partial Purification of a High-Molecular-Mass, Calmodulin-Binding, Tyrosyl-Phosphorylated Protein from Lymphocyte Plasma Membranes 85

Olga V. Zatsepina, Larisa N. Voronkova, Vsevolod N. Sakharov, and Yuri S. Chentsov. Ultrastructural Changes in Nucleoli and Fibrillar Centers under the Effect of Local Ultraviolet Microbeam Irradiation of Interphase Culture Cells 94

Jean-François Tournier, André Lopez, and Jean-François Tocanne. Effect of Cell Substratum on Lateral Mobility of Lipids in the Plasma Membrane of Vascular Endothelial Cells 105

Mariana Resnicoff and Estela E. Medrano. Growth Factors and Hormones Which Affect Survival, Growth, and Differentiation of the MCF-7 Stem Cells and Their Descendants . . 116

Patricia Emmerich, Peter Loos, Anna Jauch, Anton H. N. Hopman, Joop Weigant, Michael J. Higgins, Bradley N. White, Mels van der Ploeg, Christoph Cremer, and Thomas Cremer. Double *in Situ* Hybridization in Combination with Digitized Image Analysis: A New Approach to Study Interphase Chromosome Topography 126

Danielle Dhouailly, Cong Xu, Motomu Manabe, Alex Schermer, and Tung-Tien Sun. Expression of Hair-Related Keratins in a Soft Epithelium: Subpopulations of Human and Mouse Dorsal Tongue Keratinocytes Express Keratin Markers for Hair-, Skin- and Esophageal-Types of Differentiation 141

Luc Vanhamme and Claude Szpirer. Spontaneous and 5-Azacytidine-Induced Revertants of Methionine-Dependent Tumor-Derived and H-*ras*-1-Transformed Cells 159

Fumiko Hirose, Yasuo Hotta, Masamitsu Yamaguchi, and Akio Matsukage. Difference in the Expression Level of DNA Polymerase β among Mouse Tissues: High Expression in the Pachytene Spermatocyte 169

Hiroshi Masumoto, Kenji Sugimoto, and Tuneko Okazaki. Alphoid Satellite DNA Is Tightly Associated with Centromere Antigens in Human Chromosomes throughout the Cell Cycle 181

Nataya Weraarchakul, Randy Strong, W. Gibson Wood, and Arlan Richardson. The Effect of Aging and Dietary Restriction on DNA Repair 197

Philip H. Bonner. Correlation of Developmental Stage and Gap Junction Formation between Chick Embryo Neurons and Cloned Skeletal Muscle Myoblasts 205

Maria Fällman, Olle Stendahl, and Tommy Andersson. Phorbol Ester-Induced Activation of Protein Kinase C Leads to Increased Formation of Diacylglycerol in Human Neutrophils 217

M. Ponzoni, M. Lanciotti, A. Melodia, A. Casalaro, and P. Cornaglia-Ferraris. Morphologic and Phenotypic Changes of Human Neuroblastoma Cells in Culture Induced by Cytosine Arabinoside 226

Brian Dale and Riccardo Talevi. Distribution of Ion Channels in Ascidian Eggs and Zygotes 238

Alton L. Boynton, Robert V. Cooney, Timothy D. Hill, Thomas Nilsson, Per Arkhammar, and Per-Olof Berggren. Extracellular ATP Mobilizes Intracellular Ca^{2+} in T51B Rat Liver Epithelial Cells: A Study Involving Single Cell Measurements 245

Kenji Sobue, Keiko Kanda, Iwai Miyamoto, Kazuko Iida, Ichiro Yahara, Reiko Hirai, and Akiyoshi Hiragun. Comparison of the Regional Distribution of Calspectin (Nonerythroid Spectrin or Fodrin), α-Actinin, Vinculin Nonerythroid Protein 4.1, and Calpactin in Normal and Avian Sarcoma Virus- or Rous Sarcoma Virus-Induced Transformed Cells 256

L. Serrano, M. A. Hernández, J. Díaz-Nido, and J. Avila. Association of Casein Kinase II with Microtubules 263

C. Legraverend, A. Potter, E. Höltä, K. Alitalo, and L. C. Andersson. Interleukin-2 Induces a Rapid Increase in Ornithine Decarboxylase mRNA in a Cloned Murine T Lymphocytic Cell Line 273

C. Legraverend, A. Potter, E. Höltä, and L. C. Andersson. Interleukin-2 Regulates the Ac-

tivity of Ornithine Decarboxylase in a Cloned Murine T Lymphocytic Cell Line: Evidence for a Protein Kinase C-Dependent Pathway 282
Mahalakshmi Nagarajan and Lee F. Johnson. Regulation of Thymidylate Synthase Gene Expression in Mouse Fibroblasts Synchronized by Mitotic Selection 289

SHORT NOTE

Farzin Farzaneh, Alan Entwistle, and Rozalind J. Zalin. Protein Kinase C Mediates the Hormonally Regulated Plasma Membrane Fusion of Avian Embryonic Skeletal Muscle . . 298

NUMBER 2 APRIL 1989

SPECIAL ARTICLE

Mark Meuth. The Molecular Basis of Mutations Induced by Deoxyribonucleoside Triphosphate Pool Imbalances in Mammalian Cells 305

REGULAR ARTICLES

Jos H. Heuijerjans, Frank R. Pieper, Frans C. S. Ramaekers, Leon J. M. Timmermans, Helma Kuijpers, Hans Bloemendal, and Walther J. van Venrooij. Association of mRNA and eIF-2α with the Cytoskeleton in Cells Lacking Vimentin 317
Shay-Whey Margaret Koh. The Chick Retinal Pigment Epithelium Grown on Permeable Support Demonstrates Functional Polarity 331
Nan-Shih Liao, Joni St. John, James B. McCarthy, Leo T. Furcht, and H. Tak Cheung. Adhesion of Lymphoid Cells to the Carboxyl-Terminal Heparin-Binding Domains of Fibronectin 348
Alexei A. Bogdanov, Jr., Larisa V. Gordeeva, Vladimir P. Torchilin, and Leonid B. Margolis. Lectin-Bearing Liposomes: Differential Binding to Normal and to Transformed Mouse Fibroblasts 362
J. F. Tournier, A. Lopez, N. Gas, and J. F. Tocanne. The Lateral Motion of Lipid Molecules in the Apical Plasma Membrane of Endothelial Cells Is Reversibly Affected by the Presence of Cell Junctions 375
Rashmi Sinha, Kim E. Creek, Carol Silverman-Jones, and Luigi M. De Luca. Retinoic Acid Treatment of Fibroblasts Causes a Rapid Decrease in [^{3}H]Inositol Uptake 385
Miki Fujioka, Nobuo Shimamoto, Akira Kawahara, Minoru Amano, and Kazuo Watanabe. Purification of an Autocrine Growth Factor in Conditioned Medium Obtained from Primary Cultures of Scleral Fibroblasts of the Chick Embryo 400
Karin Scharffetter, Marc Heckmann, Atsushi Hatamochi, Cornelia Mauch, Bernd Stein, Gert Riethmüller, H.-W. Löms Ziegler-Heitbrock, and Thomas Krieg. Synergistic Effect of Tumor Necrosis Factor-α and Interferon-γ on Collagen Synthesis of Human Skin Fibroblasts *in Vitro* 409
Angeles Garcia-Pardo, Orlando C. Ferreira, Jay Valinsky, and Celso Bianco. Fibronectin Receptors of Mononuclear Phagocytes: Binding Characteristics and Biochemical Isolation 420
Kathy F. J. Tang, Paul O. P. Ts'o, and Stephen A. Lesko. Production of Interferon-β upon Induction with Polyinosinic Acid : Polycytidylic Acid during the Cell Cycle of Human Fibroblasts 432
Naseema M. Hoosein, Mary K. McKnight, Alan E. Levine, Kathleen M. Mulder, Karla E. Childress, Diane E. Brattain, and Michael G. Brattain. Differential Sensitivity of Subclasses of Human Colon Carcinoma Cell Lines to the Growth Inhibitory Effects of Transforming Growth Factor-β 442
Yoshihiko Miyata, Eisuke Nishida, Shigeo Koyasu, Ichiro Yahara, and Hikoichi Sakai. Regulation by Intracellular Ca^{2+} and Cyclic AMP of the Growth Factor-Induced Ruffling Membrane Formation and Stimulation of Fluid-Phase Endocytosis and Exocytosis 454
Monique Aumailley, Karlheinz Mann, Helga von der Mark, and Rupert Timpl. Cell Attachment Properties of Collagen Type VI and Arg–Gly–Asp Dependent Binding to Its α2(VI) and α3(VI) Chains 463
Paul D. Bonin, Greg J. Fici, and Jai Pal Singh. Interleukin-1 Promotes Proliferation of Vascular Smooth Muscle Cells in Coordination with PDGF or a Monocyte Derived Growth Factor 475
Frederick Grinnell, Hidekazu Fukamizu, Pamela Pawelek, and Shigenori Nakagawa. Collagen Processing, Crosslinking, and Fibril Bundle Assembly in Matrix Produced by Fibroblasts in Long-Term Cultures Supplemented with Ascorbic Acid 483
Jean-Marie Gasc, Francine Delahaye, and Etienne-Emile Baulieu. Compared Intracellular Localization of the Glucocorticosteroid and Progesterone Receptors: An Immunocytochemical Study 492
Christopher M. Read, Umesh A. Patel, and Tom Moss. Coordinate Replication of Dispersed Repetitive Sequences in *Physarum polycephalum* 505
J. M. Almendral, J. F. Santarén, J. Perera, M. Zerial, and R. Bravo. Expression, Cloning and cDNA Sequence of a Fibroblast Serum-Regulated Gene Encoding a Putative Actin-Associated Protein (p27) 518
W. Edward Mercer, Dariusz Jaskulski, and Michelle T. Shields. Growth Factor Regulated Expression of Poly(A)$^+$ Binding Protein Messenger RNA 531
Judith L. Roe, Helen R. Park, Warren J. Strittmatter, and William J. Lennarz. Inhibitors of Metalloendoproteases Block Spiculogenesis in Sea Urchin Primary Mesenchyme Cells 542

Mikael Nilsson, Kenneth Nilsson, and Klas Forsbeck. Increased Endocytosis and Formation of Multivesicular Bodies in Phorbol Ester-Stimulated Human Monoblastic U-937 Cells 551
Shoji Asakura and Shin-Ichi Abé. Synacrosomal Formation after Cell Fusion of Round Spermatids of *Xenopus laevis* 566

SHORT NOTES

Len Pagliaro and Jason Wolfe. Concanavalin A Inhibits Mating Type Recognition in *Tetrahymena* 574
Nobuo Kondoh, Tsuneyuki Oikawa, Yuhko Yuhki, Yoshifumi Ogiso, Chiharu Satoh, and Noboru Kuzumaki. Reduced DNase I Sensitivity of the Rearranged c-*myc* Gene in Somatic Cell Hybrids between Murine Plasmacytoma Cells and Fibroblasts 579
Norimasa Sawada. Hepatocytes from Old Rats Retain Responsiveness of c-*myc* Expression to EGF in Primary Culture but Do Not Enter S Phase 584
Bernhard Hennig, Gilbert A. Boissonneault, and Howard P. Glauert. Effects of Serum Type on Growth and Permeability Properties of Cultured Endothelial Cells 589
Author Index for Volume 181 597

GENOMICS

International Journal of Gene Mapping and Nucleotide Sequencing
Emphasizing Analyses of the Human and Other Complex Genomes

Editors-in-Chief

Victor A. McKusick
The Johns Hopkins University, Baltimore, Maryland
Frank H. Ruddle
Yale University, New Haven, Connecticut

Genomics highlights the emergence of a new area of scientific inquiry—the comparative analysis of the hierarchical organization and evolution of the human and other complex genomes.

- Provides a common meeting ground for those involved in molecular biology and genetics
- Emphasizes the integration of basic and applied research in human and comparative gene mapping, molecular cloning, large-scale restriction mapping, and DNA sequencing and computational analysis
- Publishes full-length and brief research communications, timely reviews, and editorial commentary
- Promotes efficient communication with the major genetic databases

Volumes 4–5 (1989), 8 issues
ISSN 0888-7543
In the U.S.A. and Canada: $168.00
All other countries: $189.00

Sample copies and privileged personal rates are available upon request.
For more information, please refer to S9024 and write or call:

ACADEMIC PRESS, INC.,
Journal Promotion Department
1250 Sixth Avenue, San Diego, CA 92101, U.S.A. (619) 230-1840

All prices are in U.S. dollars and are subject to change without notice. S9024

The First Definitive Resource

THE *CHLAMYDOMONAS* SOURCEBOOK

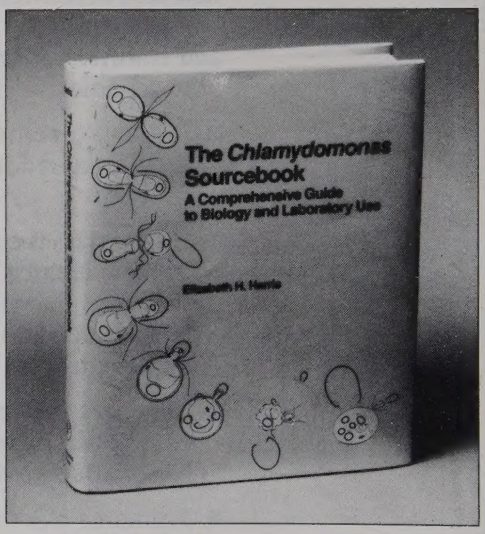
A Comprehensive Guide to Biology and Laboratory Use

Elizabeth H. Harris

This is the *only single source* available that includes all the necessary information on this vital laboratory organism. No other existing book both describes the basic biology of this experimental model system for cellular and molecular biology and at the same time gives instructions for its complete laboratory use. This thorough, self-contained laboratory tool reviews both past and present research, including a significant quantity of previously unpublished data, and is lavishly illustrated with useful diagrams and electron micrographs. **The *Chlamydomonas* Sourcebook** belongs on the lab bench of everyone working with these green algae.

Features:

- Provides access to previously unpublished data from genetic analysis
- Provides descriptions of mutant strains
- Depicts summary tables comparing properties of different species and their mutant strains
- Explains detailed methods for laboratory procedures of general utility
- Furnishes comparisons of culture media
- Presents lists of inhibitors, mutagens, and other additives to culture media
- Assists with common laboratory problems such as contamination and storage of strains
- Demonstrates protocols for laboratory demonstrations suitable for undergraduate teaching.



CONTENTS: An Overview of the Genus *Chlamydomonas*. Culture and Storage Methods. Cell Architecture and Division. The Sexual Cycle. Motility. Metabolism. Photosynthesis. Organelle Heredity. Nucleic Acids and Protein Synthesis. Genetic Analysis. Mutant Strains. Procedures and Resources. Bibliography. Index.

April 1989. c. 766 pages $145.00/£90.00
ISBN: 0-12-326880-X

ACADEMIC PRESS
Harcourt Brace Jovanovich, Publishers
Book Marketing Department #27039, 1250 Sixth Avenue, San Diego, CA 92101
24-28 Oval Road, London NW1 7DX, U.K.

© 1989 by Academic Press, Inc. All Rights Reserved.

CALL TOLL FREE 1-800-321-5068

Prices subject to change without notice. MH/ES #27039.